

IN THE SPECIFICATION:

Please replace the third complete paragraph on page 3 with the following:

The vocal input device is used for receiving a vocal input having at least one ~~alphanumeric-symbol~~ logogram and converting the vocal input into a first signal. The handwriting device is used for receiving a handwriting input describing one ~~feature~~ portion of the object ~~alphanumeric-symbol~~ logogram, and converting the handwriting input into a second signal. A vocal similarity estimator is used for generating an ~~alphanumeric-symbol~~ logogram array having a plurality of candidate ~~alphanumeric-symbols~~ logograms corresponding to the object ~~alphanumeric-symbol~~ logogram according to the first signal. A handwriting similarity estimator is used for extracting the most coincidental candidate ~~alphanumeric-symbol~~ logogram from the ~~alphanumeric-symbol~~ logogram array according to the second signal. The ~~feature~~ portion of the object ~~alphanumeric-symbol~~ logogram is the radical of the object ~~alphanumeric-symbol~~ logogram.

Please replace the final paragraph beginning on page 3 and ending on page 4 with the following:

~~Base~~ Based on the above structure, the method of the present invention integrates vocal input recognition and handwriting input recognition comprising the steps of: First, receiving a syllabic vocal input signal of one object ~~alphanumeric-symbol~~ logogram; Second, recognizing the input vocal signal and generating an ~~alphanumeric-symbol~~ logogram array having a plurality of candidate ~~alphanumeric-symbols~~ logograms corresponding to the object ~~alphanumeric-symbol~~ logogram, then receiving an handwriting input signal describing the ~~feature~~ portion of the object

~~alphanumeric-symbol~~ logogram; finally, extracting the most coincidental candidate ~~alphanumeric~~  
~~symbol~~ logogram from the ~~alphanumeric-symbol~~ logogram array according to the feature  
portion.

Please replace the first complete paragraph on page 4 with the following:

Therefore, the present invention takes advantage of complement between vocal input and  
vocal input, especially by a complete vocal input of an ~~alphanumeric-symbol~~ logogram a part of  
handwriting input including radical structure. By this way, the present invention provides more  
sufficient information for characteristic recognition, and therefore promotes recognition rate  
effectively.

Please replace the first paragraph on page 5 with the following:

Fig.4 is an illustration of a vocal database building up ~~alphanumeric-symbol~~ logogram  
array by the same pronunciation.

Please replace the second paragraph on page 5 with the following:

Fig.5 is an illustration of tracing the radical of an object ~~alphanumeric-symbol~~ logogram  
by handwriting input.

Please replace the third paragraph on page 5 with the following:

Fig.6 is an illustration of tracing the substructure of an object ~~alphanumeric-symbol~~  
logogram by handwriting input.

Please replace the fourth paragraph on page 5 with the following:

Fig.7 is an illustration of tracing the radical of the other different object ~~alphanumeric~~  
~~symbol~~ logogram by handwriting input.

Please replace the fifth paragraph on page 5 with the following:

Fig.8 is an illustration of tracing the radical of another different object ~~alphanumeric~~  
~~symbol~~ logogram by handwriting input.

Please replace the sixth paragraph on page 5 with the following:

Refer to Fig.1, in the preferred embodiment, the recognition system of the present invention integrates vocal input and handwriting input comprising a first input device 1, a second input device 2, a vocal pattern training device 3, a handwriting pattern training device 4, a first ~~feature~~ portion extractor 5, a second ~~feature~~ portion extractor 6, a vocal-input similarity estimator 7, and a handwriting-input similarity estimator 8.

Please replace the first complete paragraph on page 6 with the following:

Wherein the second signal S2 is a substructure rather than a complete handwriting input of one ~~alphanumeric-symbol~~ logogram. Because the general handwriting input device is designed to provide user for inputting in a predetermined time span, if user does not continue handwriting inputting during the time span then the handwriting motion will be considered completed. Therefore the second signal S2 means a stroke inputted during a predetermined time

span. The stroke might be only a substructure, or a radical, or the overall of one ~~alphanumeric~~  
~~symbol~~ logogram.

Please replace the last paragraph beginning on page 6 and ending on page 7 with the following:

Besides, the present invention further comprises a vocal database 30 and a handwriting database 40. The vocal database 30 stores a plurality of vocal patterns, associate Chinese vocabulary/phrases, and Chinese grammar rules, etc. For the convenience of processing the following recognition steps, the data of vocal database 30 is represented as Fig.4 (top-down [fon], [fon /], [fon V], [fon \]separately), determined by the same pronunciation and usage rate. In other word, each ~~alphanumeric-symbol~~ logogram array is constructed by many candidate ~~alphanumeric-symbols~~ logograms having the same pronunciation, and the position of the candidate ~~alphanumeric-symbol~~ logogram represent the usage rate, the position more left, the usage rate more frequent. On the other hand, the data of handwriting database is sorted by strokes of the object ~~alphanumeric-symbol~~ logogram and radical of the object ~~alphanumeric~~  
~~symbol~~ logogram. With respect to the method of building up associate database by radical or strokes of the ~~alphanumeric-symbol~~ logogram has been disclosed in the associate prior arts such as US Patent No.6539113.

Please replace the last paragraph on page 7 with the following:

Because the first ~~feature~~ portion extractor 5 connects with the first input device 1, so the first ~~feature~~ portion extractor 5 receives the first signal S1 and extracts the first input vector V1 from the first signal S1. The method of extracting the first input vector VI is, for example,

sampling the amplitude change of a certain frequency range, to obtain a plurality of ~~feature~~ portion vector that belong to different frequency ranges. In the same way, the second ~~feature~~ portion extractor 6 connects with the second input device 2, so the second ~~feature~~ portion extractor 6 receives the second signal S2 and extracts the second input vector V2 from the second signal S2, and generates a plurality of ~~feature~~ portion vector V2.

Please replace the first paragraph on page 8 with the following:

The first similarity estimator 7 connects with vocal database 30 and the first ~~feature~~ portion extractor 5. The second similarity estimator 8 connects with handwriting database 40 and the second ~~feature~~ portion extractor 6. According to the vocal pattern of vocal database 30, the first similarity estimator 7 extracts possible ~~alphanumeric-symbol~~ logogram array or ~~alphanumeric-symbol~~ logogram from the vocal database 30 by the first signal S1. Owing to building up the vocal pattern, user can effectively bypass the valueless data by saving the search time of the first similarity estimator 7 toward the vocal database 30.

Please replace the second paragraph on page 8 with the following:

In the same way, the second similarity estimator 8 extracts possible ~~alphanumeric-symbol~~ logogram array or ~~alphanumeric-symbol~~ logogram from the handwriting database 40 by the second signal S2. Besides, the first similarity estimator 7 and the second similarity estimator 8 connect each other, therefore, for example, when the first similarity estimator 7 determines a ~~alphanumeric-symbol~~ logogram array from vocal database 30 according to the vocal input of user, according to the handwriting input, the second similarity estimator 8 can also assign a

coincidental ~~alphanumeric-symbol~~ logogram from the ~~alphanumeric-symbol~~ logogram array determined by the first similarity estimator 7.

Please replace the third paragraph on page 8 with the following:

Finally, the candidate ~~alphanumeric-symbol~~ logogram determined by the first similarity estimator 7 and the second similarity estimator 8 transmitted to the application program, such as Microsoft Word, and shown on display 50. Of course, except the first input device 1 and the second input device 2, the functions of the other devices are compiled by programming codes, executed by computer. The data for use is build in vocal database 30 and handwriting database 40 in advance.

Please replace the last paragraph on page final paragraph on page 8 and ending on page 9 with the following:

Therefore, base on the above structure and as shown on Fig.2, the present invention of the recognition method integrating vocal and handwriting input is shown as step 21 and 22, first, receiving a first input. The first input device 1 is utilized to receive the vocal input and convert it to the first signal S1. For example, if user wants to input a word as Fig.5, he can do a vocal input by pronouncing [fon /] as the first input. The first input can be recognized by the first ~~feature~~ portion extractor 5 and the first similarity estimator 7, and then extract the corresponding data from the vocal database 30 to generate a ~~alphanumeric-symbol~~ logogram array coinciding with the first input. The extracted ~~alphanumeric-symbol~~ logogram array in this example is shown as Fig.4, the candidate ~~alphanumeric-symbols~~ logograms of the ~~alphanumeric-symbol~~ logogram array are sorted according to the usage rate.

Please replace the second complete paragraph on page 9 with the following:

During this time span, if the user utilizes the second input device 2 for inputting the ~~feature~~ portion presenting the characteristic of Fig.5, then as step 24 shows, extracting one recognition character corresponding to the second input from the ~~alphanumeric-symbol~~ logogram array. In this embodiment, the inputted ~~feature~~ portion of the ~~alphanumeric-symbol~~ logogram represents the radical of the ~~alphanumeric-symbol~~ logogram. Therefore, as Fig.5 shows, user may input the radical of the ~~alphanumeric-symbol~~ logogram (shown at left side as filled type).

Please replace the final paragraph on page 9 and ending on page 10 with the following:

After extracting the ~~alphanumeric-symbol~~ logogram array corresponding to the pronunciation [fon /] by the first similarity estimator 7, and then utilizing the pattern recognition technology of the second similarity estimator 8 to search the ~~alphanumeric-symbol~~ logogram with similar shape or radical from above ~~alphanumeric-symbol~~ logogram array. By this procedure, it is obvious to know that the ~~alphanumeric-symbol~~ logogram of Fig.5 with radical at the left side of Fig.5 is the most coincidental ~~alphanumeric-symbol~~ logogram matching the limitation of the second input. As step 25 shows, the most coincidental ~~alphanumeric-symbol~~ logogram represented as Fig.5 will be shown on display 50. Of course, for representing the handwriting ~~feature~~ portion of ~~alphanumeric-symbol~~ logogram as Fig.5, user may only handwriting input a part of radical such as the left side filled shape shown on Fig.6, or only handwriting input a part of the ~~alphanumeric-symbol~~ logogram distinguishing from the other candidate ~~alphanumeric-symbol~~ logogram, in this way, the system can also process the pattern recognition and extract the object ~~alphanumeric-symbol~~ logogram.

Please replace the first complete paragraph on page 10 with the following:

In the same way, another example is represented that the user wants to input a word as Fig.7. If user do a vocal input [fen \], then the system will generate a ~~alphanumeric-symbol~~ logogram array including candidate ~~alphanumeric-symbols~~ logograms corresponding to the vocal input, and user only have to do a handwriting input such as the radical (shown at upper side as filled type) of the character of Fig.7, then as Fig.7 shows, the character of Fig.7 will be extracted from the ~~alphanumeric-symbol~~ logogram array by pattern recognition technology.

Please replace the second complete paragraph on page 10 with the following:

The other example is, when the user wants to input a word as Fig.8, first, if user do a vocal input [pau \], then the candidate ~~alphanumeric-symbols~~ logograms will be sorted according to usage rate and listed. As Fig.8 shows, if user handwriting input a radical (shown at left side as filled type), then the ~~alphanumeric-symbol~~ logogram of Fig.8 including the radical will be selected by the second similarity estimator 8. Of course, if user do a handwriting input such as the other different radical, then the different ~~alphanumeric-symbol~~ logogram including the different radical will be selected. From the above examples, it can be clearly understood that the present invention effectively utilizes both the vocal and handwriting characteristic of Chinese. It is convenient for user to do only vocal input and a part of handwriting input then can recognize and input the character.

Please replace the last paragraph on page 10 ending on page 11 with the following:



On the other hand, as step 26, 27 shows, if there is not the second input, then the present invention will be merely a vocal recognition apparatus, it will extract the most frequently utilized character according to vocal input [fon /] as well as the usage rate. Of course, in this situation, the recognition rate will not be promoted, unless the input ~~alphanumeric-symbol~~ logogram happens to be the most frequently utilized character.

Please replace the first complete paragraph on page 11 with the following:

Besides, refer to Fig.3, the present invention can also be represented as step 201 ~ 203, if user does vocal input [fon /], then the most frequently utilized candidate ~~alphanumeric-symbol~~ logogram (the ~~alphanumeric-symbol~~ logogram of Fig.5 without the left side radical part) will be shown on the display 50. If user finds that the input object is an ~~alphanumeric-symbol~~ logogram as Fig.5 rather than the most frequently utilized candidate ~~alphanumeric-symbol~~ logogram, then user can process the second input (a radical shown at left side as filled type of Fig.5) in a predetermined time span. As step 204, 205 shows, the present invention will extract the ~~alphanumeric-symbol~~ logogram as Fig.5 from the ~~alphanumeric-symbol~~ logogram array corresponding to the second input, and as step 206 shows, replace the most frequently utilized candidate ~~alphanumeric-symbol~~ logogram by ~~alphanumeric-symbol~~ logogram with a radical characteristic.

Please replace the second complete paragraph on page 11 with the following:

On the basis of the characteristic of Chinese, even a plurality of ~~alphanumeric-symbols~~ logograms correspond to the same pronunciation, the discrimination between the ~~alphanumeric~~

~~symbols~~ logograms is quite obvious, taking Chinese character on Fig.4 for example, the radical and handwriting style for each ~~alphanumeric symbol~~ logogram is quite different.

Please replace the third complete paragraph on page 11 with the following:

Therefore, by the complement between vocal input and handwriting input, user can easily and effectively promote the recognition rate by the combination of vocal input of an ~~alphanumeric symbol~~ logogram and radical part of handwriting input, rather than completely handwriting input each complex ~~alphanumeric symbol~~ logogram. Therefore, the present invention makes the input and recognition more efficient.